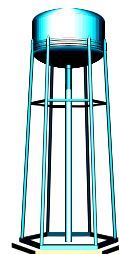




THE WATER SPOUT



Nebraska Department of Health and Human Services
Division of Public Health

Volume XXI "SAFE DRINKING WATER IS WHAT WE SPOUT ABOUT" August 2008

Backflow and Boilers

Michael Wentink, Field Services and Training

Under the provisions of the Safe Drinking Water Act (SDWA), the Administrator of the Environmental Protection Agency (EPA) has responsibility for establishing national standards for safe drinking water. States that are granted primary enforcement authority (primacy), as allowed by the SDWA, are responsible for the enforcement of these standards. The water purveyor (supplier) is held responsible for compliance to the provisions of the SDWA to ensure that drinking water conforms with the EPA standards at the source, and is delivered to the customer without the quality being compromised as a result of its delivery through the distribution system.

To meet this end, Nebraska SDWA regulations, Title 179 NAC 22, require that community and non-transient non-community public water systems implement a program for the effective detection and elimination of cross-connections and prevention of backflow. Components of an effective program include identification of cross-connections, installation of appropriate backflow prevention devices, methods or assemblies, and annual testing. Cross-connections are the links through which contaminating materials might enter a potable water supply due to backflow. These links can be actual or potential connections and constitute a public health hazard. Cross-connections may appear in many subtle forms and in unsuspected places.

Documented reports of backflow occurrence do exist, some with significant public health impacts. The Centers for Disease Control (CDC) publishes a *Morbidity and Mortality Weekly Report* (MMWR) series based on weekly

reports to CDC by state health departments. Two incidents reported in the 1990s relating to an unusual illness due to cross-connections are summarized below.

A school nurse contacted a poison information center regarding the acute onset of illnesses in 49 children in first through fourth grades in one school. All of the children had visited the school nurse after lunch because of blueness of the lips and fingers. Initial questioning by the poison center did not identify possible sources, and it was suggested that the children be examined at a hospital. When the children were examined, additional complaints included nausea, vomiting, and headache. An emergency department physician made the presumptive diagnosis of methemoglobinemia (MetHb).

MetHb was diagnosed in 29 of the 49 students, and 14 of the children were hospitalized and treated with supplemental oxygen and intravenous methylene blue. All patients recovered fully without (Continued on page 2)

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Website address:

<http://www.dhhs.ne.gov/enh/pwsindex.htm>

Main phone number: (402) 471-2541

24-hour Emergency Phone:
(402) 499-6922

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complications within 36 hours.

An investigation indicated that the children with MetHb had eaten soup diluted with water obtained from hot and cold water taps in the school kitchen. Analysis of the leftover diluted soup detected nitrite levels of 459 parts per million (ppm). Investigation also revealed the hot water boiler had been serviced earlier with commercial conditioner fluid containing nitrite and sodium metaborate, and when tested, the backflow check valve was determined to be faulty and stuck in the open position. Traces of sodium metaborate were found in the leftover diluted soup.

In a second incident, a poison information center was contacted by an office worker regarding the acute onset of blueness of skin in six of her office coworkers who had been meeting in a conference room, and it was suggested that the workers be examined at a hospital. Four of the six workers were evaluated by physicians and MetHb was diagnosed based on analysis of blood samples. Two patients were treated with supplemental oxygen and intravenous methylene blue, and all recovered without complications within 24 hours.

All six workers had onset of illness after drinking coffee prepared with water from a nearby hot water faucet. Analysis of the leftover coffee detected a nitrite level of 300 ppm. During the subsequent field investigation of this outbreak, the backflow prevention valve on the boiler was determined to be defective and replaced. Fluid in the boiler contained both nitrites and sodium borate. Traces of sodium borate were found in the coffee.

The two episodes resulted from ingestion of water originating from potable municipal sources that had become contaminated with boiler fluid because of inadequate backflow prevention. This potential mechanism for nitrite exposure has not been widely recognized. Excessive levels of nitrite or nitrate may result in the acute syndrome of methemoglobinemia, a blood disorder in which nitrite binds to hemoglobin and prevents the blood from delivering oxygen effectively to different parts of the body. This blood disorder has very visible signs and primarily affects infants. As a result, the infant may have blueness around the mouth, hands, and feet (hence the name, "blue baby syndrome"). The boiler fluids probably refluxed when the boilers were started, thereby generating high pressure and fluid reflux into the buildings' water systems.

Source: Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report; March 7, 1997; 46 (09); 202-204
<http://www.cdc.gov/MMWR/preview/mmwrhtml/00046656.htm>

Water System Security Grant Funding

By Doug Woodbeck, Field Services and Training

For the past several years, the Department has made funds available to public water systems (PWS) through a Drinking Water State Revolving Loan Fund (DWSRF) set-aside, for the purpose of enhancing water system security and improving emergency response. These grants have been available to community PWS serving 10,000 or fewer persons.

Based on the improvements observed, the Department believes that this is the right direction to proceed with available funding. Although our intent is to continue this program, recent concerns on the federal level regarding DWSRF funding may limit its availability. The Nebraska DWSRF Intended Use Plan for State Fiscal Year 2009 has been approved and includes an amount for PWS water system security grants.

Since no funding is available at this time, we will not be accepting any applications until we receive funding for the program. Notification will be made to all eligible water systems. If/when funding becomes available, it will be no sooner than April 1, 2009. If you have any questions regarding the grants or the grant application process, please contact me at (402) 471-0521.

Title 179

Latest Revision Dates of Regulations

NAC

2-001	November 15, 2003
2-002	November 13, 2005
2-007	September 15, 1991
2-015	September 22, 1999
3	November 13, 2005
4	November 13, 2005
5	July 16, 2002
6	March 22, 2004
7 & 8	Reserved
9	March 22, 2004
10	October 3, 2004
11	November 15, 2003
12	November 15, 2003
13	February 6, 2008
14	November 13, 2005
16	November 13, 2005
17	November 13, 2005
18	November 15, 2003
19	November 13, 2005
21	March 22, 2004
22	March 22, 2004

These regulations can be viewed at:

<http://www.dhhs.ne.gov/reg/t179.htm>

REGULATORY UPDATE

Update on Title 179 NAC 13

By Elizabeth Esseks, Monitoring and Compliance

Attachment 1 of 179 NAC 13

An incorrect, outdated version of Attachment 1 was incorporated into Chapter 13, and that mistake was discovered in February 2008 after copies of the revised Chapter 13 were mailed to owners of community water systems (see April 2008 “Water Spout”). Attachment 1 has been corrected, and the correct attachment became effective on August 12, 2008. Copies of Chapter 13, Attachment 1 may be printed from the Department’s Website at <http://www.hhs.state.ne.us/reg/t179.htm> (scroll down to Chapter 13; attachments are at the end of the chapter). You will be sent instructions on how to request a paper copy of the attachment soon.

Attachment 2 of 179 NAC 13

The protocol for determination of influence of surface water on ground water sources (Chapter 13, Attachment 2) has changed, and the new protocol became effective on February 6, 2008.

Major components of the new protocol are listed below:

- 1) Ponds, lakes and streams are identified as obvious surface water sources.
- 2) New sources are identified as potentially at risk of being ground water under the direct influence of surface water (GWUDI) if any of the following conditions exists: (a) The source of water is a spring, horizontal/radial collector well, or an infiltration gallery; (b) The top of the uppermost intake structure of a well is less than or equal to 50 feet from the ground surface; (c) There is evidence of *E. coli* contamination of the discharge of the source; (d) The source of water is less than 200 feet from a source of surface water; (e) There are defects in the condition of the upper terminus; or (f) There is inadequate information to assess whether the source meets one of the criteria listed above (the owner of the public water system is given the opportunity to provide the required information).
- 3) Existing sources are identified as potentially at risk of being GWUDI if any of the following conditions exists: (a) A waterborne disease outbreak takes place in the public water system service area and the public water system is suspected of being the cause; (b) There is evidence of *E. coli* contamination in the source water and the source water meets any of the criteria for new sources being potentially at risk of being GWUDI; or (c) The public water system has continuous disinfection, the source water meets any of the criteria for new sources being potentially at risk of being GWUDI, and the source has not been previously evaluated by the Department using temperature, pH, turbidity or microscopic particulate analysis.
- 4) All sources identified as potentially at risk of being GWUDI must have microscopic particulate analysis samples collected from them by department staff. [There is no option to collect 12 months of temperature, pH, and/or turbidity data.]
- 5) A minimum of 2 samples must be collected from each potentially at risk source. The source will be deemed GWUDI if any of the following indicator organisms are present in both samples: green algae, blue/green algae, diatoms, nematodes, flagellates, and gastrotrichs.
- 6) If sample results are inconsistent, two additional samples will be collected. If any two of the four samples contain any of the indicator organisms listed above, the source will be deemed GWUDI.

Copies of Chapter 13, Attachment 2 may be printed from the Department’s Website at <http://www.hhs.state.ne.us/reg/t179.htm> (scroll down to Chapter 13; attachments are at the end of the chapter). You will be sent instructions on how to request a paper copy of the attachment soon.

Please contact Elizabeth Esseks if you have any questions about Chapter 13 or its attachments (elizabeth.esseks@dhhs.ne.gov ; 402-471-1010).

Grades I - IV and VI Continuing Education – 2008

Please contact the appropriate organization at the phone number provided for further information regarding these scheduled training activities.

			Hours Available for Grade						
Date	Location	Topic(s)	I	II	III	IV	VI	Contact	Phone
September 9	Wayne	Water Operator	5	5	5	5	0.75	NeRWA	402-443-5216
September 9	Fremont	Water Operator	3	3	3	3	0	DHHS	402-471-0523
September 10	Cozad	Water - NIMS	5	5	5	5	0	LoNM/AWWA	402-476-2829
September 12	Grand Island	PVC Pipe	3	3	3	3	0	AWWA	402-435-3080
Sept. 15 – 17	Gering	Water Operator	15	15	15	15	5	NeRWA	402-443-5216
September 23	Beatrice	Backflow	5	5	5	5	5	AWWA	402-476-2829
September 24	Papillion	Water Operator	5	5	5	5	0	NeRWA	402-443-5216
September 24	Wayne	Backflow	5	5	5	5	5	AWWA	402-476-2829
September 25	Grand Island	Backflow	5	5	5	5	5	AWWA	402-476-2829
September 26	Ogallala	Backflow	5	5	5	5	5	AWWA	402-476-2829
October 1	Fremont	Utility EXPO	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
October 7	Sidney	Water Operator	5	5	5	5	0	LoNM/AWWA	402-476-2829
October 8	McCook	Water Operator	5	5	5	5	0	LoNM/AWWA	402-476-2829
October 9	North Platte	Backflow	3	3	3	3	5	CCC	1-877-222-0780
October 10	Grand Island	Backflow	3	3	3	3	5	CCC	1-877-222-0780
October 15	Wahoo	Water Operator	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
October 16	Wahoo	Water Operator	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
October 21	Stapleton	Water Operator	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
October 21	Bellevue	Backflow	TBA	TBA	TBA	TBA	TBA	E. Nebr. ABPA	402-416-2600
October 23	Kimball	Water Operator	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
October 23	Papillion	Backflow	TBA	TBA	TBA	TBA	TBA	TBR	1-888-305-5292
Nov. 6 – 7	Kearney	Water Operator	8	8	8	8	1.5	AWWA	402-399-1357
November 12	Grand Island	Water Operator	TBA	TBA	TBA	TBA	TBA	CCC	1-877-222-0780
November 13	Oshkosh	Water Operator	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
November 14	Columbus	Backflow	3	3	3	3	5	CCC	1-877-222-0780
November 18	Seward	Backflow	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
November 19	Fairbury	Water Operator	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
November 19	North Platte	Water Operator	5	5	5	5	0	LoNM/AWWA	402-476-2829
November 20	Tecumseh	Backflow	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
November 20	Lexington	Backflow	TBA	TBA	TBA	TBA	TBA	TBR	1-888-305-5292
November 24	Scottsbluff	Backflow	TBA	TBA	TBA	TBA	TBA	MAP	308-436-2700
November 25	Wahoo	Backflow	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216
December 2	Grand Island	Backflow	TBA	TBA	TBA	TBA	TBA	TBR	1-888-305-5292
December 3	Gretna	Backflow	3	3	3	3	5	CCC	1-877-222-0780
December 4	Gretna	Backflow	3	3	3	3	5	CCC	1-877-222-0780
December 4	Lincoln	Water Operator	5	5	5	5	0	LoNM/AWWA	402-476-2829
December 9	Wakefield	Water - NIMS	5	5	5	5	0	NeRWA	402-443-5216
December 10	Lyons	Water Operator	5	5	5	5	0	LoNM/AWWA	402-476-2829
December 10	Waterloo	Water Operator	TBA	TBA	TBA	TBA	TBA	NeRWA	402-443-5216

AWWA – Nebraska Section American Water Works Association
CCC – Central Community College, Grand Island (When calling the 877 number, select extension #7527, or call 308/398-7527.)

DHHS – Nebraska Department of Health and Human Services,
Division of Public Health

E. Nebr. ABPA – Eastern Nebraska Chapter of American Backflow
Prevention Association

LoNM – League of Nebraska Municipalities, Lincoln

MAP – Midwest Assistance Program

NeRWA - Nebraska Rural Water Association, Wahoo

TBA – Hours not assigned at time of printing

TBR – Total Backflow Resources, Salix, IA

Water Operator Courses - 2008

Register Early!
Registration required at least two
weeks prior to the class (Seating
is limited). Call Barb at
(402) 471-0523.

PWS Regulation Review

Strongly encouraged for Grade IV Course attendees

Begins at 1:00 P.M. on the afternoon prior to the two-day Grade IV course

Open to all; 3 hours of continuing education available for water operator grades 1 – 4

September 9 Fremont
December 16 Grand Island

Grade IV

Cost is \$80.00 for the class, \$98.00 for the books if needed, and \$94.00 for certification.

September 10 – 11 Fremont
December 17 – 18 Grand Island

Grade III

Cost is \$200.00 for the class, \$98.00 for the books if needed, and \$94.00 for certification.

October 6 – 10 Beatrice

Grade I & II

Cost is \$200.00 for the class, \$98.00 for the books if needed, and \$94.00 for certification.

None scheduled

Grade VI Training Classes

October 20 – 24 Papillion
Contact Total Backflow Resources at (888) 305-5292 or (712) 946-1012.

October 27 – 31 Wahoo
Contact the Nebraska Rural Water Association at (800) 842-8039 or (402) 443-5216.

November 17 – 21 Lexington
Contact Total Backflow Resources at (888) 305-5292 or (712) 946-1012.

Emergency Access ID Cards

By Doug Woodbeck, Field Services and Training

Following an emergency declaration or in other situations where devastation has occurred, such as the tornado that hit Hallam, Nebraska, not too many years ago, law enforcement/emergency response authorities (such as the State Patrol or the Nebraska Emergency Management Agency) will many times limit or completely deny access to the affected area. This is done to preserve personal property and prevent hindrances to subsequent damage assessment and cleanup. Even as the licensed water operator for the system, to enter the area you may have to show officially recognized identification credentials or wade through governmental red tape prior to entry.

With this potential issue in mind, the Department of Health and Human Services Division of Public Health (DHHS DPH) has consulted with the Nebraska Emergency Management Agency (NEMA) and other response agencies that have authority to control access to a community to determine what type of identification would be acceptable in the event such a situation occurred. Based on this input, DHHS DPH has developed a format that will be acceptable to allow an authorized person, such as a licensed water system operator, to enter a disaster area to fulfill the emergency response role and responsibilities as the designated operator of the water system.

This identification card format will accomplish the aforementioned purpose and the Department will be offering these ID cards to all licensed water operators of community and/or municipal water systems. The IDs require a photo. For those operators interested in obtaining one of these IDs, our current plan is to begin this project by taking photos of water operators attending the Nebraska Rural Water Association Fall Conference in Gering in September. If possible, we may be printing the cards on-site; if not, the cards will be mailed to the appropriate persons soon after.

Participation in this initiative **IS NOT** mandatory. It is strictly voluntary. Having this acceptable identification will likely expedite your entry into your community when access has been limited by outside authorities following a natural or man-made disaster. For questions regarding this effort, please contact me at (402) 471-0521.

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www.dhhs.ne.gov/enh/pwsindex.htm



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